

Abstract

A method for forecasting batch end conditions through their depiction as a multi-dimensional regions of uncertainty is disclosed. A visualization of the current condition of a continuous process and visualization of the simulated effect of user control moves are generated for a user. Volume visualization tools for viewing and querying intersecting solids in 3-dimensional space are utilized to perform the process visualization. Interactive tools for slicing multi-dimensional (>3) regions and drawing superimposed projections in 3-D space are provided. Additionally, graphical manipulation of the views of process conditions is accomplished by changing the hypothetical future values of contributing variables online in order to provide users the ability to simulate the effect of proposed control actions. The illustrative embodiment of the present invention may also be utilized in combination with a graphical programming environment supporting the execution and simulation of block diagrams and correspondingly generated process data. The scores representing the process condition may depend on estimated physical quantities as well as representations of process variability.